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The Corporation of The City of Hamilton

DEPARTMENT of
STREET SERVICES

URBAN/MUNICIPAL

PROPOSAL

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Maintenance Management Implementation Program

Roy Jorgensen Associates of Canada, Ltd.



CORPORATION OF THE
CITY OF HAMILTON

PROPOSAL

MAINTENANCE MANAGEMENT SYSTEM
IMPLEMENTATION PROGRAM

ROY JORGENSEN ASSOCIATES OF CANADA, LTD.

523 The Queensway
Toronto, Ontario

January 1975

ROY JORGENSEN ASSOCIATES OF CANADA, LTD.

Management Consultants

523 THE QUEENSWAY
TORONTO, ONTARIO, M8Y 1J7
TELEPHONE (416) 251-8822

January 8, 1975

Mr. R.A. Morden,
Director of Street Services,
City of Hamilton,
City Hall,
P.O. Box 2040,
Hamilton, Ontario.
L8N 3T4

Dear Mr. Morden:

We are pleased to submit this Proposal for the implementation of a Maintenance Management System.

Our Proposal outlines this firm's philosophy of maintenance management, describes the proposed Program and how it will be accomplished, and includes a cost estimate for our services. Also included are details of our extensive qualifications to undertake such a Program and particulars on staff members who will be available to work on the project.

We believe that Roy Jorgensen Associates of Canada, Ltd. is uniquely qualified to undertake this project for the City of Hamilton. We have pioneered the field of roads and streets maintenance management and, indeed, developed the maintenance strategy now considered essential in many jurisdictions throughout Canada, (including Ontario municipalities), the United States, and abroad. These qualifications are expanded on the green pages in this Proposal.

The experienced staff of professionals employed by RJA have implemented Maintenance Management Systems in five provinces, eight regions, twelve counties, and twenty-six cities, towns, boroughs and townships in Canada. While uniform in concept, each has been customized to the clients particular needs.

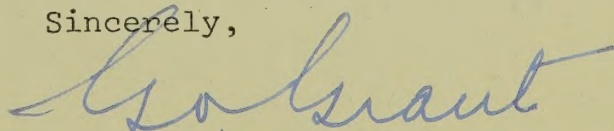
We are aware of the special conditions that exist in the City of Hamilton involving the responsibilities for City roads as well as the roads of the Region of Hamilton-Wentworth within the City boundaries. It will also be necessary to coordinate all of the activities of the Department of Street Services so that there is no dislocation of management effort.

The Hamilton system should be compatible with the system presently in use in the Roads Division of the Regional Department of Engineering. This should not infer that the system will be the same but the similarity be such that work could be performed by either agency for the other with complete understanding by both parties.

We also recognize that organizations similar to yours have a greater need for practical, flexible, logical, easily communicated, uniform maintenance systems than they have of top-heavy, technique-oriented, paper-generating monsters. Practicability has always been a dictum in our approach.

We would appreciate the opportunity to assist the City of Hamilton in this Program.

Sincerely,



George O. Grant
President

GOG/srf

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PREFACE

The purpose of this Proposal is to set out the objectives to be attained in a Program for implementing a Maintenance Management System for the City of Hamilton; to detail how the Program would be accomplished; to indicate the desired involvement of City officials and staff; and to designate areas of assistance that would be carried out by the Consultant, Roy Jorgensen Associates of Canada, Ltd.

The benefits from undertaking a Maintenance Management Program are as follows:

I BENEFITS TO COUNCIL

Policies are converted to workload

Resources are related to workload

Performance budget based on workload

All levels of managers work to the
plan of Council.

II BENEFITS TO MANAGEMENT

Budget translates into practical work program

Work program expresses Council's wishes in
work terms

Work program simply communicated to working
levels

Resources compatible with work program

Means to measure accomplishment and
effectiveness

Simple, immediate feedback reports

Effective but not onerous control methods.

PROGRAM OBJECTIVES

Over the past few decades, many management and technical advances have been made in numerous areas of government and industry. During most of this period, comparable emphasis was not directed toward improving the management and technical aspects of public works maintenance. This neglect to implement maintenance improvements has been the result of an unfounded, but common assumption that maintenance is unpredictable. The improbability of anticipating exact maintenance needs at identifiable locations or at specific times has led many to consider maintenance as unplannable, and as a consequence, uncontrollable.

However, recent maintenance management system implementation programs in a number of Ontario municipalities, along with such programs in provinces, states, counties and cities in Canada and the United States, has verified that effective management of public works maintenance can be accomplished by systematically approaching the planning, organizing, directing and controlling of the maintenance functions. Much of this work has been directed toward providing the "decision makers" with accurate, timely and objective information that enables them to more effectively manage all maintenance operations.

Simply stated the program objectives are to design and implement a comprehensive management system covering all operations carried out by the City work force and will include the following:

- MANAGEMENT SEMINAR
- INVENTORY OF ITEMS REQUIRING MAINTENANCE
- WINTER MAINTENANCE PLAN
- ORGANIZATIONAL REVIEW
- EVALUATION OF MANPOWER, EQUIPMENT AND MATERIAL NEEDS
- INTEGRATION OF ACCOUNTING AND PAYROLL SYSTEMS WITH OTHER DEPARTMENTS
- FIELD AND HEAD OFFICE PROCEDURES MANUALS
- CONSULTANT PARTICIPATION IN PREPARATION OF TWO PERFORMANCE BUDGETS.

PROGRAM COST ESTIMATE

The Consultant proposes that the various phases of the Implementation Program specified in this Proposal would be completed within the following resources.

	<u>CONSULTANT MAN-DAY ESTIMATE</u>	<u>TOTAL CONSULTANT COST</u>
PHASE 1 - Develop program schedule; Familiarize all levels of management with program; conduct progress meetings.	10	
PHASE 2 - Review organization and assist in implementing organization changes.	10	
PHASE 3 - Define work activities/ accomplishment units.	10	
PHASE 4 - Develop facility inventory procedures, conduct inventory.	10	
PHASE 5 - Develop performance standards/unit costs.	25	
PHASE 6 - Design and implement reporting and feedback system.	35	
PHASE 7 - Design and implement work scheduling procedures.	15	
PHASE 8 - Prepare work program and performance budget.	30	
PHASE 9 - Prepare and implement winter maintenance plan.	25	
PHASE 10 - Monitor operation of the System.	35	
PHASE 11 - Document System.	10	
SUB TOTAL	215	\$47,300
Travel, subsistence, miscellaneous	man-days	1,700
UPSET LIMIT		\$49,000

From the experience of RJA there is little likelihood of an overrun of the proposed upset limit unless there is a major change in the terms of the Implementation Program or if some unexpected condition arises such as a change in key personnel within the City staff which would necessitate additional training. Should such a condition develop any renegotiation of the upset limit would be on the same basis as indicated in the section of this Proposal entitled "Method of Payment".

PRELIMINARY IMPLEMENTATION SCHEDULE

(Assumes February 1975 start)

MONTH	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J
PHASE 1 - Develop schedule; Familiarize all levels of management; conduct progress meetings.	*		*					*				*						*
PHASE 2 - Review Organization and assist in implementing changes.		*											*					
PHASE 3 - Define work activities.				*									*					
PHASE 4 - Develop facility inventory.		*		*														
PHASE 5 - Develop performance standards.		*		*						*								
PHASE 6 - Reporting and feedback system.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
PHASE 7 - Work scheduling procedures.		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
PHASE 8 - Work program and performance budget.			*								*	*	*	*	*	*	*	*
PHASE 9 - Winter maintenance plan.											*	*	*	*	*	*	*	*
PHASE 10 - Monitor.							*	*	*	*	*	*	*	*	*	*	*	*
PHASE 11 - Document System.			*															

RJA CANADA LTD. QUALIFICATIONS

RJA is uniquely qualified to design and implement a Municipal Maintenance Management System (MMMS) in the City of Hamilton. Consider these facts:

1. RJA created the MMMS for which the City of Hamilton is requesting an implementation proposal.
2. No other Consultant in Canada can match RJA's depth and experience in MMMS.
3. The firm has maintained a close association with the City through several related projects.
4. RJA's implementation approach is practical and thorough.

MAINTENANCE MANAGEMENT SYSTEM CONCEPTS

RJA Canada, Ltd. created the Ontario-Municipal Maintenance Management System in 1969 on the basis of its earlier, pioneering work in this field. The system was developed under the auspices of the Department of Highways, now the Ministry of Transportation and Communications.

The MMMS Implementation Manual is RJA's documentation of that strategy, a strategy which has been:

1. Fully endorsed by the Ministry of Transportation and Communications.
2. Presented as a specific guideline to all other consultants and implementing municipalities.

The City's request for a proposal was, in fact, taken from the manual RJA developed and leaves no doubt that it is the RJA-created MMMS which it wants implemented.

The firm, since its inception, has been and remains in the forefront of MMMS. In recent years it undertook a study within the National Cooperative Highway Research Program, under the auspices of the Highway Research Board and the United States Federal Highway Administration. That study, now printed as NCHRP Report 131, Performance Budgeting System for Highway Maintenance Management, is considered the definitive work in this area.

MAINTENANCE MANAGEMENT SYSTEM EXPERIENCE

RJA specializes in the design and implementation of Maintenance Management Systems; no other Canadian consultant does. These statements can be verified:

1. RJA has designed and successfully implemented more roads/streets Maintenance Management Systems in Ontario or, indeed, Canada, than all other consultants combined.
2. The firm has implemented or is in the process of implementing MMMS in these jurisdictions of comparable size to that of Hamilton:
 - Borough of Scarborough
 - Borough of Etobicoke
 - Borough of North York
 - City of Mississauga
 - City of Windsor
 - City of Ottawa
 - Region of Ottawa/Carleton.

3. In addition, RJA has implemented or is implementing Maintenance Management Systems in the Provinces of British Columbia, Manitoba, Ontario, New Brunswick, Nova Scotia and in these Ontario jurisdictions:

REGIONS

Haldimand-Norfolk
Metropolitan Toronto
Muskoka
Niagara
Waterloo
York

COUNTIES

Brant
Dufferin
Ontario
Peel
Simcoe
Victoria
Waterloo
Wellington
Wentworth

MUNICIPAL GOVERNMENTS

Brampton
Burlington
Fort Erie
Guelph
Ingersoll
King
Markham
Nepean

Niagara Falls
Norfolk
Oshawa
Sarnia
Streetsville
Thunder Bay
Vaughan
Woolwich.

4. The firm maintains close contacts with a U.S. affiliate which also specializes in road maintenance and whose experience is available to us should consultation be necessary.

THE CITY OF HAMILTON AND RJA

RJA has been involved with several key projects associated with the City of Hamilton, the old County of Wentworth and Hamilton/Wentworth Region. We undertook these projects:

1. 1969 - Management Improvement Study in the
Department of Engineering, City of
Hamilton.
2. 1972 - MMMS Design and Implementation, Wentworth
County.
3. 1974 - Assumption of a Regional Roads System,
Regional Municipality of Hamilton-
Wentworth.

From these studies RJA has gained first-hand knowledge of the City - its structure, personnel and facilities. Of particular value is that RJA already understands and appreciates the City's roads system, its maintenance interfaces and budgetary constraints.

RJA APPROACH TO MAINTENANCE MANAGEMENT

RJA does not preach pie-in-the-sky theory, nor writes voluminous reports for client action, nor deals in razzle-dazzle technical jargon. The firm designs and implements practical, effective Maintenance Management Systems and trains and educates client personnel in their use.

RJA follows the principles documented in the MMMS Implementation Manual and customizes them to suit the client's unique environment. The firm is absolutely comfortable in modifying where required. Having created MMMS in the first place, it is perfectly aware of what part each segment plays, how it may be manipulated and with what ramifications, and how the system or any portions can be adapted to a particular situation.

Any material developed by RJA on other projects will be available to the City of Hamilton as reference material.

RJA will place an experienced, full time Project Manager on site. He will be supported by professionals with whatever expertise is necessary to supplement the City's environment. These areas of expertise include:

1. Civil and mechanical engineering.
2. Vehicle and heavy equipment maintenance.
3. Accounting and finance.
4. General and computer systems.
5. Transportation planning.
6. Manpower and personnel planning.
7. Traffic and safety.

IMPLEMENTATION PROGRAM

The services described herein would be provided by the Consultant as assistance to the City of Hamilton in carrying out a program for implementation of a Maintenance Management System for public works facilities.

MAJOR PROGRAM PHASES

The Program for implementation of a Maintenance Management System for the City of Hamilton would be divided into eleven major phases as follows:

1. Develop Implementation Program schedule; Familiarize all levels of management with Implementation Program; Conduct regular progress review meetings.
2. Review operations organization and assist in implementing organization changes.
3. Define work activities and accomplishment units.
4. Develop facility inventory procedures and conduct inventory.
5. Develop performance standards and the cost of doing a unit of work for each activity.
6. Design and implement reporting and feedback system.
7. Design and implement work scheduling procedures.
8. Prepare work program and performance budget.
9. Prepare and implement winter maintenance plan.

10. Monitor operation of the Maintenance Management System.
11. Document the System.

PROGRAM WORK PLAN

The System would be implemented and fully operational within 12 months after work commences and monitored by the Consultant for a further period of 8 months to ensure effective operation. This timing will result in the first performance budget being prepared by restructuring the regular budget for the 1975 fiscal year and in the preparation of a second performance budget for the 1976 year based on Hamilton statistical information.

The Program would be carried out under supervision of a Coordinating Committee which is composed of elected officials and appointed managers of the City of Hamilton, representatives of the Ministry of Transportation and Communications, and representatives of Roy Jorgensen Associates of Canada, Ltd. Periodic meetings of this Committee would be held during the course of the Implementation Program for approval of policies and to keep all parties fully informed of Program progress.

Day-to-day direction of the Implementation Program and liaison with City personnel in other Departments would be provided by a Project Coordinator. City personnel would be assigned part-time to the Program as required. The City would designate a clerk/technician who would be involved in the regular ongoing processing of data required for the maintenance management system.

The work that would be carried out during each major phase of the Implementation Program is discussed below in some detail.

PHASE 1 - DEVELOP IMPLEMENTATION PROGRAM SCHEDULE

The Consultant would prepare and review a plan setting out the specific time schedule for meeting the objectives of the Implementation Program.

- FAMILIARIZE ALL LEVELS OF MANAGEMENT WITH THE IMPLEMENTATION PROGRAM

Meetings with all managers of the City involved in any way with maintenance would be held to outline the Implementation Program, explain the Maintenance Management System, and answer relative questions. These meetings would be conducted by the senior officials of the City staff and the Consultant.

PHASE 2 --REVIEW DEPARTMENT ORGANIZATIONS AND ASSIST IN IMPLEMENTING ORGANIZATION CHANGES

The existing department organizations would be examined by the Consultant for adherence to *good* organization principles and the compatibility with operation of a Maintenance Management System.

If necessary, the Consultant would make recommendations as to alteration of the organization structure.

The Consultant would prepare position guides detailing function, responsibility, authority and key relationships for each managerial and supervisory position involved with public works. Also, the formal organization chart for the forces involved in the department would be reviewed and changes recommended if necessary.

The Consultant would assist in the implementation of approved organization changes. This would include instruction and training of personnel in-so-far as the scope of the Program permits so that desired behaviour changes of groups and/or individuals would be most fully realized.

PHASE 3 - DEFINE WORK ACTIVITIES AND ACCOMPLISHMENT UNITS

Existing fiscal maintenance activity definitions would be examined to determine their adequacy for management purposes -- planning work and measuring performance. Several of the more important criteria used in this examination are as follows:

- work activities should be clearly defined so managers at all levels have uniform understanding of the service levels to be maintained and consequently, the work to be performed,
- work activities should be defined in simple terms to cover singular methods and procedures of doing work,
- work accomplishment units should be assigned to major work activities which are easily identifiable and measurable by field personnel. Work accomplishments are necessary so that planning can be carried out for how much work is to be done; so that information can be reported on how much work is actually done; and so that managers can determine how effectively resources are utilized in doing the work.

From this examination, a list of major work activities and accomplishment units for maintenance of all facilities would be recommended. Emphasis in preparing this list would be placed on avoiding an excessive number of activity definitions. Explicit activities would be defined for those 'vital few' activities that account for approximately 90% of the total expenditures devoted to maintenance, since the greatest management effort should be devoted to planning and controlling these activities. The remaining activities, accounting for 10% of the expenditures (referred to as the 'trivial many'), can be consolidated for planning, reporting and controlling purposes.

The advice and counsel of the Superintendents, their staff and field personnel would be sought in arriving at work activities and accomplishment units.

PHASE 4 - DEVELOP FACILITY INVENTORY PROCEDURES AND CONDUCT INVENTORY

The Consultant would review existing inventory records and develop inventory procedures for collecting information not available, but required to support the maintenance management system.

An inventory of physical features that influence public work maintenance requirements would be carried out by the Consultant, the Superintendents and foremen. The data gathering should take about one week to complete.

PHASE 5 - DEVELOP PERFORMANCE STANDARDS AND ACTIVITY UNIT COSTS

Suggested performance standards for maintenance work activities in terms of level of service, planning values, productivity standards, and methods and procedures would be established by the Consultant and senior City managers. These performance standards would be submitted to the Coordinating Committee and to the respective Committees of Council for their adoption.

The cost of carrying out a unit of work in each activity would be determined by the Consultant through an analysis of approved work methods and procedures.

PHASE 6 - DESIGN AND IMPLEMENT REPORTING AND FEEDBACK SYSTEM

The Consultant would design and implement a work reporting and feedback system which will provide each level of management with timely and accurate reports of maintenance work accomplished and resources used. This reporting system will be designed to be compatible with, and provide input to, the fiscal accounting system. The reporting system will also be designed to provide the Ontario Ministry of Transportation and Communications with

required information. During this phase close liaison will be established with the City Treasurer to establish adequate fiscal accounts.

The Consultant would implement the approved reporting and feedback system in such a manner as to offset the natural apprehension about change on the part of the field supervisory staff and encourage participation on their part rather than opposition.

PHASE 7 - DESIGN AND IMPLEMENT WORK SCHEDULING PROCEDURES

The Consultant would design and implement work scheduling procedures to provide field supervisors in the Department with an effective method of coordinating work efforts with work programs.

PHASE 8 - PREPARE WORK PROGRAM AND PERFORMANCE BUDGET

The Consultant would develop and implement procedures for preparation of maintenance work programs and performance budgets in the Department.

The Consultant would assist the Senior staff of the City in preparing an initial systematized maintenance work program and performance budget for the fiscal year 1975. As well the Consultant would assist in the preparation of the 1976 budget.

PHASE 9 - PREPARE AND IMPLEMENT WINTER MAINTENANCE PLAN

The Consultant would develop and assist in implementing a plan to help ensure established winter maintenance levels of service are met. Data will be gathered during the 1974-75 winter period to enable the development of a winter maintenance plan for the 1975-76 winter period.

PHASE 10 - MONITOR OPERATION OF THE MAINTENANCE MANAGEMENT SYSTEM

From the Consultant's experience in implementing Maintenance Management Systems in numerous agencies, monitoring the System after implementation is a real *key* to ensuring that the System is an easily understood, useful and beneficial *management tool*. Monitoring involves working with each manager, instructing him in uses of System information and teaching him how to use such information in day-to-day management.

PHASE 11 - DOCUMENT THE SYSTEM

The Consultant would document elements of the Maintenance Management System for guidance of the senior managers of City departments and the staff in operating and maintaining the System.

PROGRAM ORGANIZATION

CONSULTANT RESPONSIBILITIES

The Consultant would:

1. Provide professional guidance and assistance needed to successfully plan, organize and carry out work covered by this Proposal.
2. Provide a project manager to be responsible for day-to-day supervision of the work and would provide other specialized personnel as required.
3. Prepare a work plan and schedule for the Program, and regularly meet with senior City managers and periodically with the Coordinating Committee to review the actual accomplishments for both the short and long-term period.
4. Bring to the attention of the senior managers and Coordinating Committee, deviations from the planned Program which may delay the work completion date, and make recommendations respecting the alteration of either the assigned resources or the completion date.
5. Provide data and technology developed in connection with maintenance management research projects completed or underway in other municipal agencies by the Consultant so that research findings and materials developed elsewhere can be used directly, or in modified form, in the development of a Maintenance Management System for managing the facilities in the City of Hamilton.

CITY RESPONSIBILITIES

The City of Hamilton would:

1. Appoint key elected and management officials, as determined, to the Coordinating Committee which will review Program progress with the Consultant and evaluate key System elements.
2. Designate a senior staff representative of the Department to work with the Consultant as Program Coordinator and to provide liaison between all the City Departments and Consultant for the duration of the Program.
3. Provide copies of existing statistical and financial data, maps, charts and records of the City as requested by the Consultant.
4. Provide drafting, duplicating, secretarial, clerical (to process day-to-day data necessary for the operation of the system) and other incidental services as required.
5. Provide office space, equipment, incidental supplies, reproduction services and other such related items as required by the Consultant.

OTHER CONSIDERATIONS

In order to obtain maximum acceptance and utilization of the System and system information in the City of Hamilton, RJA feels that *effective communications is a key*. To accomplish effective communication of the Program and System between the various organizational levels within the City, the following will be carried out:

1. Meetings of the Coordinating Committee will be held to review all aspects of the Maintenance Management System and the Implementation Program.
2. Meetings will be held at the outset of the Program with the City work forces to review general objectives of the Program, outline the System and answer any questions regarding the System.
3. The field managers will be involved and consulted throughout the Program. The System must be used in making day-to-day management decisions, therefore their understanding and acceptance of the System is paramount.
4. Accounting and payroll personnel will be involved in the Program as the System must satisfy both fiscal and management purposes.
5. Training sessions will be held with the field managers to assist in implementation and acceptance as each System element is introduced throughout the Program.

6. Monitoring of the reporting system will be carried out for a sufficient period to pinpoint problem areas. Remedial action will be taken, where required, as soon after the fact as possible.
7. Regular meetings will be conducted with the field managers to review System implementation progress and maintenance work performance. This procedure would commence very early in the Program and be eventually incorporated into the work scheduling aspect of the System.
8. A management seminar will be conducted dealing with Human Relations. This will expose the staff to modern concepts of management theory and practice.

METHOD OF PAYMENT

The Consultant's fee would be based on the following:

- the actual cost of the direct salaries of staff assigned to the Program plus 100%, and
- disbursements for expenses properly incurred in the performance of the work.

However, the fee would be limited by an upset figure (see Program Cost Estimate) after which no further payments need be made. Direct salaries include the following fringe benefits paid by the Consultant to his staff:

- payment for statutory holidays,
- workmen's compensation insurance,
- vacations with pay,
- unemployment insurance,
- health and medical insurance,
- group life insurance,
- approved pension plan
- sick leave allowance.

Such fringe benefits exclude any bonus or profit sharing system. Premium rates for overtime would not be charged.

Monthly progress payments for Consultant services would be made throughout the Program.

If, during the course of the Program, the terms of reference constituted by this Proposal were to be altered by the City of Hamilton, the upset limit may be renegotiated.

STAFF QUALIFICATIONS

RJA Canada Ltd. staff specializes in Maintenance Management Systems. All Consultants on staff, without exception, have Maintenance Management experience. Their combined experience in this area totals over 40 years.

The Project Manager, Mr. R.A. Russell, will be a Consultant with over 4 years of experience in Municipal Maintenance Management Systems. He has valuable Hamilton-related experience in that he designed and implemented MMMS in Wentworth County, and was a member of the team in the Assumption of Regional Roads Study done for Hamilton-Wentworth Region.

Mr. Russell will be supported as required by other members of the consulting staff, all of whom are professional people with appropriate degrees and experience in engineering, roads/streets maintenance, equipment maintenance, accounting and finance, general and computer systems, transportation planning, manpower and personnel, organization structures. Also, the initiator of the Municipal Maintenance Management System, RJA's Vice-President Mr. Allan Madar, will be taking a personal interest in the project.

Attached are the resumes of a selective segment of our staff, each of whom would be available for consultation should the need arise.

ROBERT A. RUSSELL

Associate

EDUCATION

Brigham Young University (1968) B.Sc.
Psychology, minor in Communications

PROFESSIONAL HISTORY

1968 - 1970

Supervisor of Business Management Development, Alberta Department of Education. Responsible for the development and maintenance of extension management training programs in Southern Alberta. Assessed training requirements and developed courses and seminars for private business, associations, personnel and human relations seminar leader.

1970

Manager, Marine Auto Terminals Ltd., Toronto Ontario. Responsible for establishing the firm in Ontario and developing redelivery service and transportation system for imported autos in Ontario.

1970 - 1972

Associate, Roy Jorgensen Associates of Canada, Ltd. Assisted in the development and implementation of Maintenance Management Systems for Peel County, Town of Mississauga, Regional Municipality of York, District Municipality of York and Wellington County.

1972

Associate, RJA Canada, Ltd. Assisted in the development of a design and construction management system applicable to municipalities for the Ontario Ministry of Transportation and Communications.

1971

RJA Canada, Ltd. Session leader for numerous management seminars.

1972 to 1974

Project Manager, RJA Canada, Ltd. Responsible for development and implementation of a maintenance management system for Wentworth County, Ontario, Town of Fort Erie and the County of Brant., Regional Municipality of Haldimand Norfolk.

1974 to date

Conducted Training Needs evaluation in Ghana West Africa for Public Works Department. Assisted in Assumption of Regional Roads Study for Hamilton-Wentworth Region. Project Manager, RJA Canada, implementing Maintenance Management System in Region of Niagara, Building Division.

GEORGE O. GRANT, P.Eng., *President, Roy Jorgensen Associates of Canada, Ltd.*

EDUCATION *Queen's University (1942) B.Sc. Civil Engineering*

*University of California, Berkeley, (1956)
M.Eng. (Transportation & Traffic Eng.)*

TECHNICAL SOCIETIES

*Association of Professional Engineers of Ontario
Roads & Transportation Association of Canada
Ontario Good Roads Association
Highway Research Board (USA)
Institute of Public Administration of Canada
National Research Council.*

PROFESSIONAL HISTORY

1942 - 1946 *Served in the Canadian Armed Forces and participated in active duty in the Italian and Northwest Europe Campaigns.*

1946 - 1954 *Commenced work with the Department of Highways, Ontario as District Maintenance and Construction Engineer. (1946-1949). District Engineer for Ottawa District of the Department (1949-1953). Assistant Deputy Minister (1954).*

1955 *Attended University of California.*

1956 - 1968 *Commissioner of Roads, Municipality of Metropolitan Toronto. During this period, Mr. Grant was responsible for the planning, design, construction and maintenance of the basic road system of expressways and arterials.*

1968 to date *President, Roy Jorgensen Associates of Canada, Ltd. As such, Mr. Grant is engaged in the marketing, directing and staffing of all work carried out by RJA of Canada, Ltd.*

ALLAN F. MADAR

Vice President

EDUCATION

Certified General Accountant (1956)
University of Western Ontario (1968), M.B.A.

TECHNICAL SOCIETIES

Certified General Accountants Association

PROFESSIONAL HISTORY

1950 - 1957

B.C. Packers Ltd. Vancouver as an Accountant

1957 - 1967

Westcoast Transmission Co. Ltd., Vancouver
as Accountant of subsidiary companies.
Supervisor of General Accounting. Supervisor
of Methods, Procedures and EDP. Assistant
to Vice President, Planning and Research.

1966 - 1968

MBA Program, University of Western Ontario

1968

Research Associate, Roy Jorgensen Associates
of Canada, Ltd. Participated on Phase 2 of
the Ontario Municipal Maintenance Management
Study in two municipalities.

1968 - 1970

Project Manager, RJA, Inc. NCHRP Project
19-2 which developed a model maintenance
performance-related budgeting system for use
by State highway departments including
procedures for developing, operating and
implementing system elements.

1970

Systems Specialist, RJA, Inc. Illinois State
Toll Highway Authority Study to determine the
feasibility of mini-computerization of toll
gates and to evaluate the reporting require-
ments and the financial analysis of equipment
alternatives.

1970 - 1971

Budget/Accounting Specialist, RJA, Inc.
Paraguay, South America, Maintenance
Management Project. Included design and
implementation of accounting, budgeting
and costing systems for the highways
department.

1971

Project Manager, RJA Canada, Ltd. New
Brunswick Department of Highways Maintenance
Management System Project. Responsible for
designing, implementing and monitoring a
complete maintenance management system from
the definition of appropriate maintenance
activities, through the determination of
physical resources and financial budgets,

continued..

ALLAN F. MADAR, continued

to the feedback, evaluation and control mechanisms required.

1971

Project Consultant, RJA Canada, Ltd.
Ministry of Transportation and Communication
Ontario Project 12003 - Operational Review
of Computing Facilities.

1971

Project Consultant, RJA Canada, Ltd.
Ministry of Transportation and Communication
Ontario Project 12005 - Impact on MTC of
implementing the centralized automatic data
processing recommendations.

1972

Project Consultant, RJA Canada, Ltd.
Ministry of Transportation and Communication
Ontario Project 12004 including systems
review of basic motor vehicle registration
concepts, and feasibility and direction of
automation of the motor vehicle registration
system.

1972

Senior Associate, RJA Inc. Sierra Leone,
Africa Highways Department. Design and
implementation of total accounting system.

1972

Project Consultant, RJA Canada, Ltd.
Ontario Ministry of Transportation and
Communications for automation of the motor
vehicle registration system.

1973

Principal, Allan F. Madar Consultant.
System specialist on various projects for
the Ontario Ministry of Transportation and
Communications as well as for municipal
governments and private industry.

1974 to date

Vice President, Roy Jorgensen Associates of
Canada, Ltd. Participates in marketing of
consulting services, supervision of on-going
Canadian work, and development of consulting
staff.

STUART E. SMART, P.Eng.

Associate

EDUCATION

Royal Military College of Canada (1965)
Bachelor of Engineering (Civil)

TECHNICAL SOCIETIES

Association of Professional Engineers of
Ontario
American Public Works Association

PROFESSIONAL HISTORY

1965 - 1967

Staff Engineer, Canadian Armed Forces.
Assigned to #1 Construction Engineering Unit
(ICEU), Winnipeg during which time Mr. Smart
was involved in several engineering projects
across Canada.

1967 - 1968

Base Construction Engineer Officer, Canadian
Armed Forces, Moosonee, Ontario. This assign-
ment included responsibility for construction
maintenance and operation of all facilities for
the self contained base.

1968 - 1970

Research Associate, RJA Canada, Ltd. Municipal
Maintenance Management Study, Ontario Ministry
of Transportation and Communications responsible
for the developing, testing and implementing of
a model maintenance management system in two
test municipalities, the City of Oshawa and
Ontario County.

1970 - 1971

Project Manager, RJA Canada, Ltd., Municipal
Maintenance Management Study. Responsible for
testing and implementing maintenance management
systems in Peel County, Regional Municipality
of York, and the Town of Mississauga.

1972

Project Manager, RJA Canada, Ltd. Responsible
for development of a design and construction
management system applicable to municipalities
for the Ontario Ministry of Transportation and
Communications.

1970 to date

RJA Canada, Ltd. Session leader for numerous
management seminars.

1972 to date

Project Manager, RJA Canada, Ltd. Responsible
for development and implementation of a mainten-
ance management system for the Town of Brampton,
Town of Burlington, Town of Streetsville, City
of Windsor and the City of Sarnia.

W. JONATHAN ARMSTRONG, P.Eng.

Associate

EDUCATION

Queen's University (1971) B.Sc. Mining Engineering, presently working towards The Registered Industrial Accounting Diploma.

TECHNICAL SOCIETIES

Member, Association of Professional Engineers of Ontario.

PROFESSIONAL HISTORY

1971 - 1972

Mines Engineer with Falconbridge Nickel Mines Ltd. Mr. Armstrong was on the management training program studying the production, industrial engineering and bonus departments.

1972 - 1973

Associate, RJA of Canada, Ltd. Assisting in the development and implementation of a Maintenance Management System for the County of Simcoe Roads Department.

1973 - 1974

Project Manager, responsible for the development and implementation of a Maintenance Management System for the Township of Woolwich and for the on-going review of the implemented system in the Region of Waterloo.

Mr. Armstrong was also involved in the design and implementation of a maintenance management system for the Department of Public Works and Traffic in the City of Sault Ste. Marie and for the Burlington Recreation Services.

1974 to date

Project Manager, responsible for the development and implementation of a MMS for the Township of Norfolk and for the completion of the MMS for the Township of Vaughan and the Town of Markham.

Mr. Armstrong is also responsible for the development of self-instructional training material for the Ghana Highway Authority.

PETER G. WILSON , P. Eng.

Associate

EDUCATION

University of Toronto (1970) B.Sc. Industrial Engineering
University of Toronto (1972) MBA

TECHNICAL SOCIETIES

Association of Professional Engineers of Ontario.

PROFESSIONAL HISTORY

1969 - 1970
(summers)

Mr. Wilson's summer work experience included the following:

- Foundation Co. of Canada, Ltd. Assisted in surveying, layouts, quantity determinations and inspections.
- Toronto Board of Education. Developed manpower levelling and CPM model and computer program for efficiently scheduling tradesmen on renovation projects.
- Toronto Dominion Bank. Assisted in preparation of market studies and branch development proposals.

1970 - 1972

Administration Officer, Maintenance Engineering Branch, Ontario Housing Corporation. Mr. Wilson's duties included supervision and administration of tender document preparation processing; general administration for the 55 Head Office employees of the Maintenance Engineering Branch; preparation and distribution of Branch reports, documents and correspondence.

1972

Manager, Operations and Administration, CORE Maintenance & Associates, Ltd. Mr. Wilson was responsible for developing procedures for such functions as accounting, communications, filing, correspondence, general office administration; coordination of company divisions; supervision and approval of payment of accounts.

1972 to date

Associate, Roy Jorgensen Associates of Canada, Ltd. Mr. Wilson is assisting in the design and implementation of a maintenance management system for the Metropolitan Toronto roads system and for the City of Oshawa.

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